

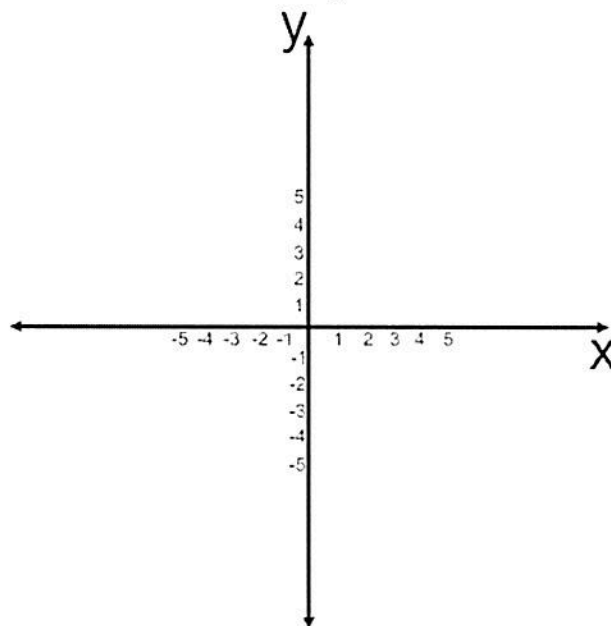
1. If $f(x) = x^3 + 3x - 2$, determine $f(x-3)$
2. If $h(x) = \sqrt{x-9}$, $f(x) = x+3$, and $g(x) = 2x^2$ find an expression for $(f \circ h \circ g)(x)$
3. Evaluate $\frac{f(x+h) - f(x)}{h}$ if $f(x) = x^2 - 2x + 5$
4. Find the inverse of $f(x)$ if $f(x) = \sqrt{2x+3}$
5. Write the equation of the line in point-slope, slope-intercept, and standard form that passes through the points (4,4) and (-7,2)
6. Express $\frac{12}{\sqrt{x+12}}$ as a composite of two or more functions
7. Show that $f(x)$ and $g(x)$ are inverses of each other. $f(x) = \sqrt{x+3}$ and $g(x) = x^2 - 3$
8. Simplify $\frac{2x^4}{x^3 - x^2}$ completely. (Remember to write down any restrictions.)
9. Use the geometric definition of absolute value to find the solution set to the following.
 - a. $|3-x| = 4$
 - b. $|5-2x| \geq 4$
10. Perform the indicated operation(s) and simplify. (Do not forget to write the restrictions.)
 - a. $\frac{4 - x^{-2}}{2x^{-1} - x^{-2}}$
 - b. $\frac{x^2 - xy}{xy + 2y^3} \div \frac{x^2 + xy}{xy + y^2}$
11. Solve inequality and express the solution set in (a) set builder notation and (b) interval notation.

$$\frac{x^2 - 4x - 5}{(x-2)^2} > 0$$

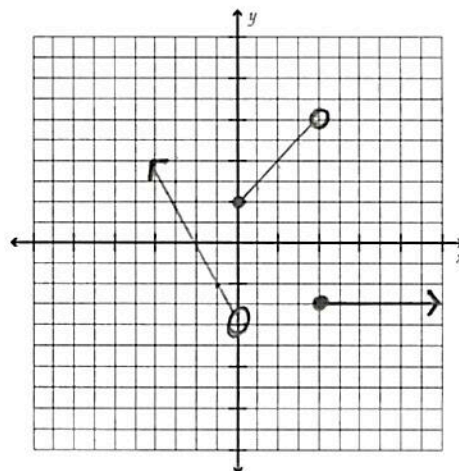
12. Write $f(x) = -x^2 + 4x + 6$ in vertex form.

13. Sketch the function without using a graphing calculator. Find the domain and range of each function.

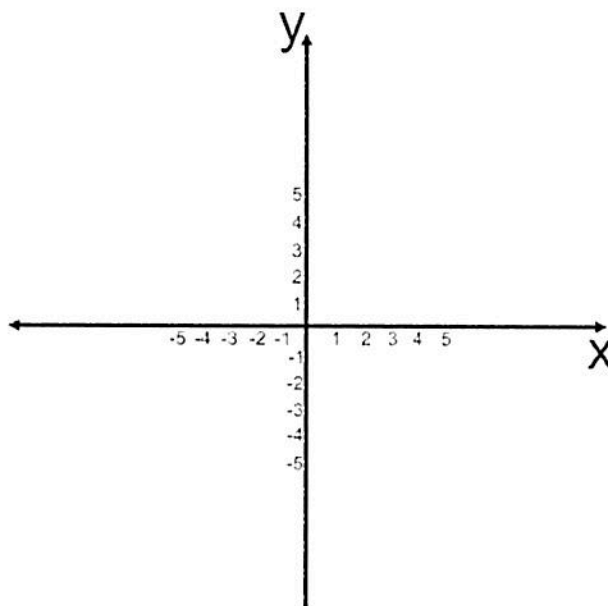
$$a. \quad f(x) = \begin{cases} -x^2 + 4, & x \leq 2 \\ \frac{1}{2}x - 3, & 2 < x < 4 \\ \sqrt{x-4}, & x \geq 4 \end{cases}$$



14. Write a piecewise function for the graph

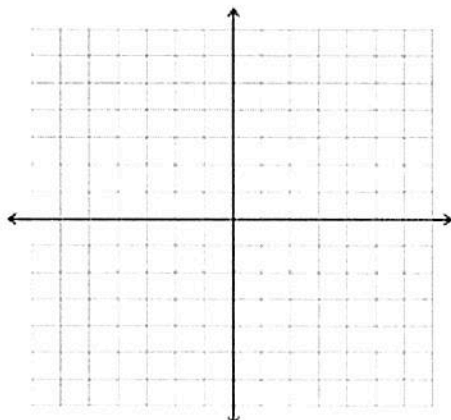


15. Use the algebraic definition of absolute value to rewrite $f(x) = |3x - 2| + 1$ as a piecewise function and then sketch each graph.

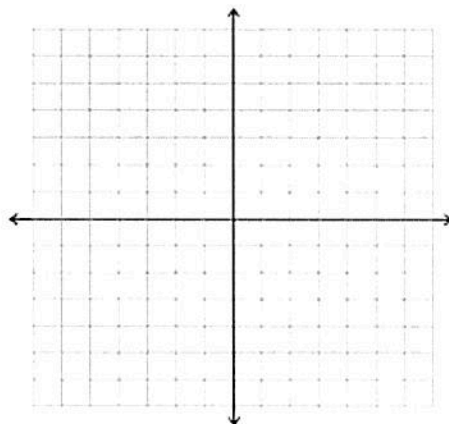


16. Describe each transformation in terms of the parent function and then graph the function. State the domain, range, and any x- or y- intercepts.

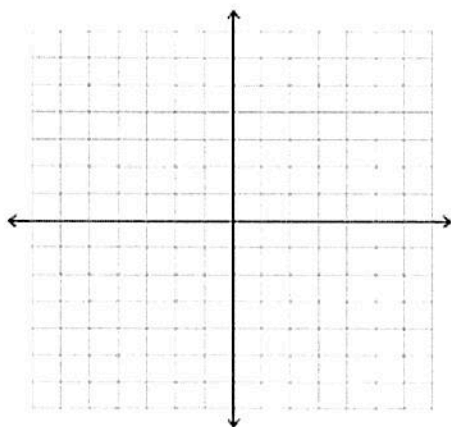
a. $f(x) = 2 - (x + 3)^2$



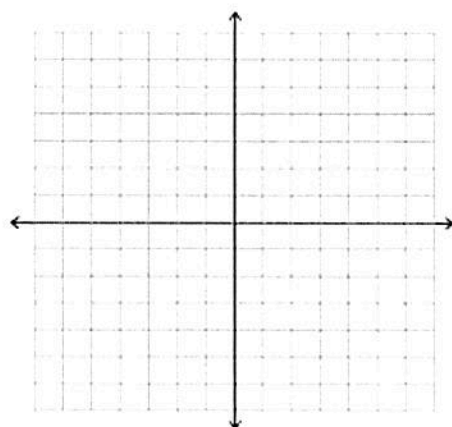
b. $f(x) = -|x - 4|$



c. $f(x) = \sqrt{x - 1} + 5$



d. $f(x) = (-x)^3 + 3$



17. Determine algebraically if the following functions are even, odd, or neither

a. $f(x) = -x^4 + 4x^2$

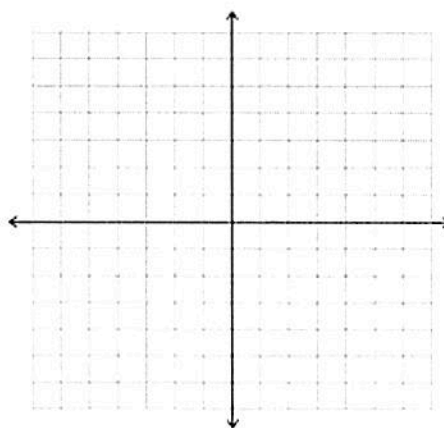
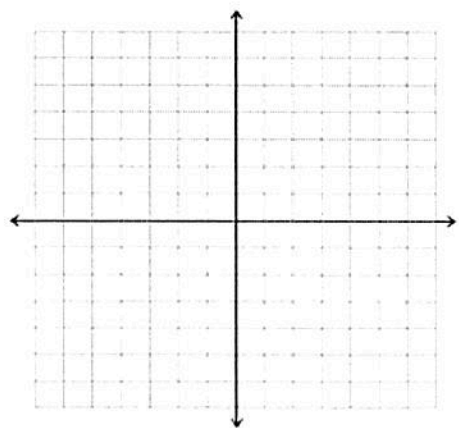
b. $f(x) = \frac{x^3}{x^2 - 4}$

18. Use polynomial long division to find the quotient of $x^4 - 5x^2 + 6x - 7$ divided by $x^2 + 2$
19. Use synthetic division to find the quotient of $(x^4 - 5x + 10) \div (x - 3)$
20. Show that $(x - 3)$ is a factor of $P(x) = x^3 - 7x - 6$, and find the other factors.
21. Determine if $(x - 2)$ is a factor of $f(x) = x^3 - 13x^2 + 23x - 11$
22. List all of the possible rational roots for $f(x) = -3x^2 + 5x + 4x^3 - 6$
23. What is the complete factorization of $f(x) = x^3 - 13x - 12$
24. What are the roots of $f(x) = x^3 - 13x - 12$
25. If $(x - 16)$ is a factor of $f(x)$, then what is one of the zeros?
26. If $f(5) = 0$, what is one of the factors of $f(x)$?

27. Graph the following using a minimum of 2 points. For each graph, state the domain, range, intercepts, and the equations of any asymptotes.

a. $y = -\frac{1}{(x+4)} + 2$

b. $y = \frac{1}{(x-1)^2} - 1$



28. Fill in the chart:

Function	Hole(s)	Vertical Asymptote(s)	Horizontal Asymptote	x-intercept(s)	y-intercept
$y = \frac{5-x}{x^2-25}$					

